Abstract

A Markov chain on a finite or countable graph $S$ can be described as a random journey of a particle along the vertices of $S$, in such a way that upon arriving at a vertex $v$, and regardless of the path which led to it, the particle chooses its following destination $v'$ at random among $v$'s neighbors in $S$, according to predetermined probabilities $P(v,v')$.

The transition matrix $P$ holds the answer to a variety of interesting questions concerning the Markov chain, such as, what is the particle’s limiting distribution in $S$, at which the rate is the convergence achieved, and what is the expected number of steps needed to reach $v_2$ from $v_1$.

This theory is nicely summarized in Chapter 1 of the book *Markov Chains* by J. R. Norris (Cambridge University Press) which deals with the discrete case described above. We shall implement it for a non-trivial Markov chain, or maybe two, hopefully reaching interesting conclusions. The prerequisites are an introductory Probability course and a basic acquaintance with matrices.